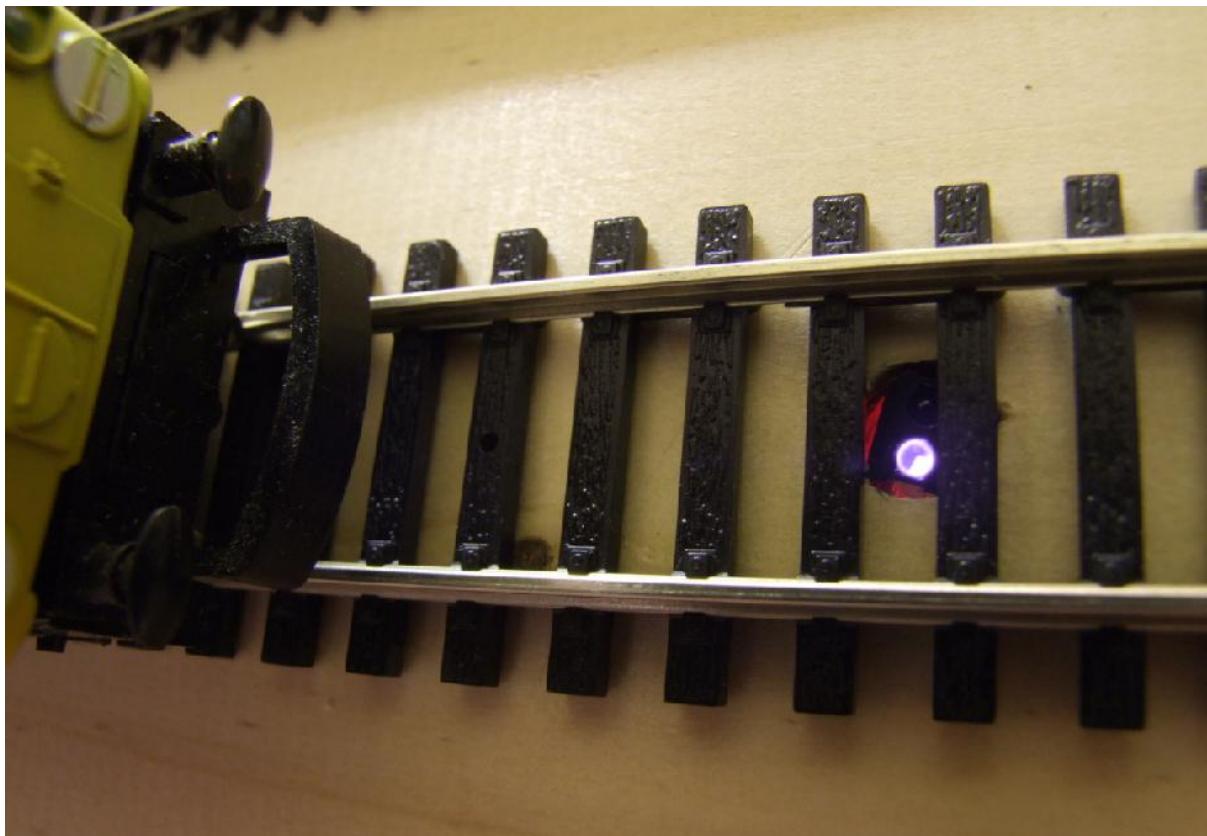


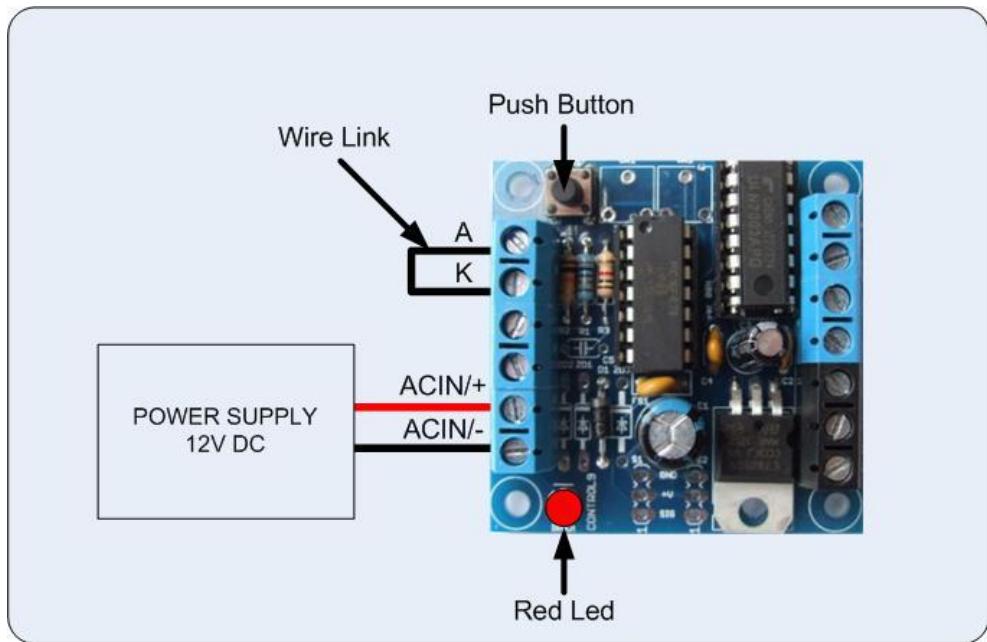
## GUIDE TO TROUBLESHOOTING INFRA RED SYSTEMS



Infra-red systems offer very high reliability of detecting rolling stock passing over the sensor. If you are having problems with triggering of the system, this document should help isolate the problem.

Firstly, all BLOCKsignalling modules that use infra-red triggering have a red led on the PCB which is wired in series with the infra-red sensor. If this red led is not lit, then the infra-red sensor led is not lit either, so checking this red led can help solve triggering problems.

If the red led has not been seen working, disconnect the four sensor wires and place a link wire between the A and K terminals on the PCB.



Apply power and check if the red led lights.

If it does, then the PCB is operating correctly (even if the red led only lights briefly). If the red led does not light, then refer to the instructions for your module for the correct operating voltage, and check the wiring from the power supply to the input terminals of the PCB.

All modules can be tested on 12V DC. Take care to get the polarity correct, connecting the negative supply to the terminal marked GND, 0V or with a “ - ” symbol. All modules are protected against reverse polarity, and cannot be damaged if the connections are incorrectly made.

### Reset to Factory Default

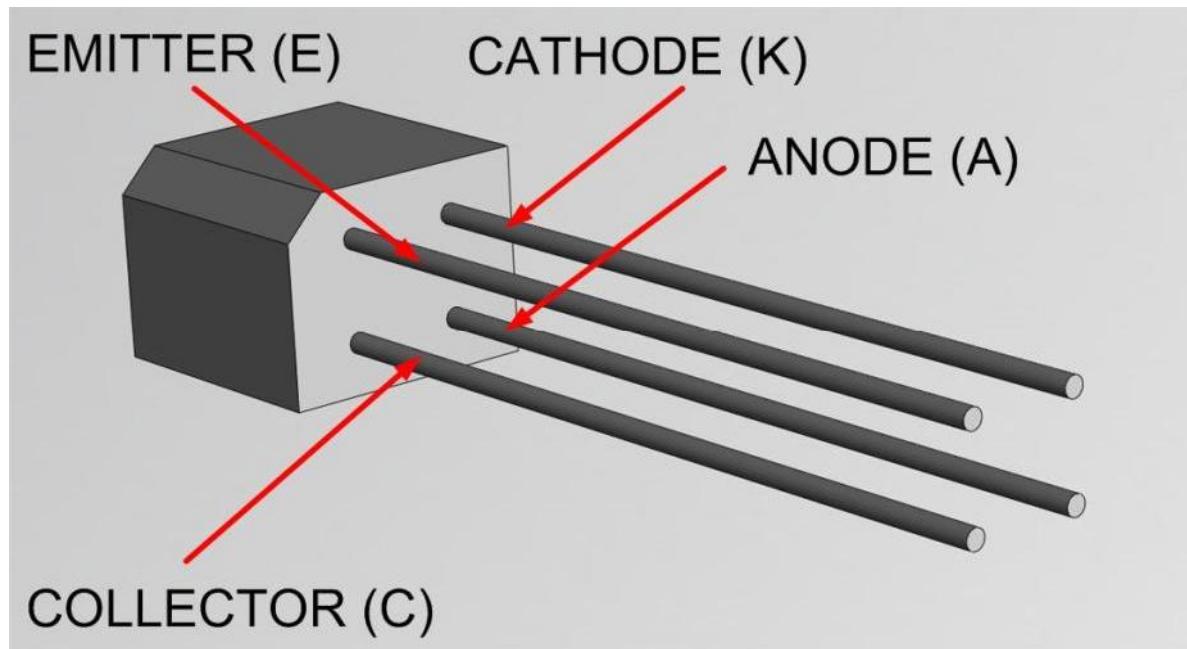
If the red led lights, then reset the module to its factory default. This will ensure the module will operate predictably in a test mode when the power is applied.

To do this, switch off the power to the module and hold down the Push Button. Apply the power and continue holding the push button until **1 flash** of the red led is seen. At this point, release the button. You will see a long flash of five seconds.

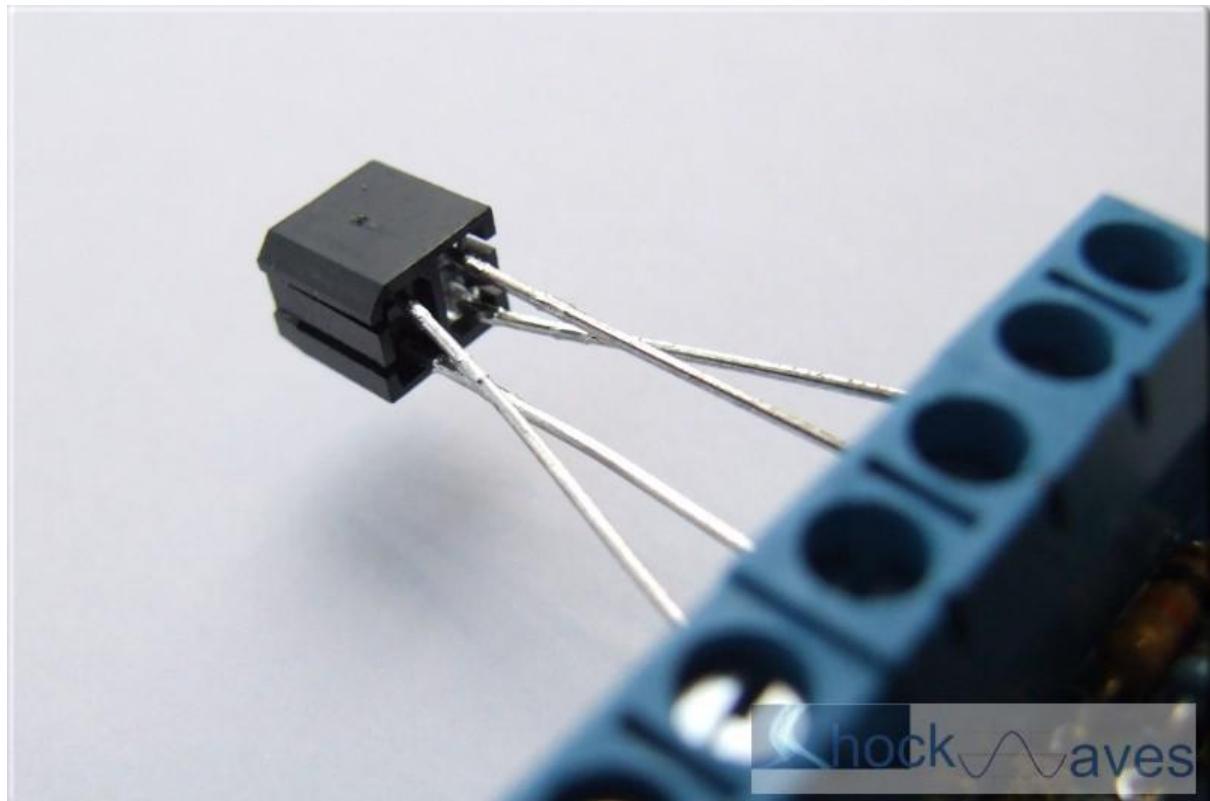
The led will begin flashing again. When you have seen **1 flash** press the button. You will see a long flash of five seconds and then 10 rapid flashes. The reset procedure is then complete and the module will restart with factory settings, and run a test mode, such as switching the outputs in sequence. If you make a mistake programming, simply repeat the process.

When the power is switched on now, the red led on the PCB should be seen flashing on and off at 1 second intervals.

## Connect the Infra-Red Sensor



The infra-red sensor has four wire connections. Identify the chamfer on the side of the body of the sensor, and then fan the leads out and connect to the module.



Turn the power on again, and confirm that the red led on the PCB flashes as before. If the led no longer works, carefully check the connections to the A and K terminals against the photos above and make sure the connections are secure. If these are correct, and the led flashed with the wire link in place, then the sensor is probably faulty.

### **Check the Led on the Infra-Red Sensor**

If the led on the PCB flashes correctly, then the infra-red led is also flashing. You can check this with a mobile phone camera, video camera or digital camera, as these can see the infra-red light which is otherwise invisible to the naked eye.

The led in the sensor produces a very dim purple light. This may be seen best with the room lights off. The picture at the top of this article was taken in a very dark room, and the camera has picked up the light from the sensor beneath the track.

The led in the sensor should be seen lit at the same time as the red led on the PCB. If the infra-red led is seen to be correctly flashing in unison, then that part of the infra-red sensor is operating correctly.

### **Sensitivity Setting**

The sensitivity of the sensor is set in the factory to mid-range, and should be triggered by placing a hand within 2.5cm (1 inch) of the face of the sensor (the factory reset performed above sets the module sensitivity back to mid-range). To test this, select a program on the module which is triggered by the infra-red sensor. Typically, this is programme 2 or programme 3, but do check the instructions for your particular module to be sure.

To select this program, switch off the power to the module and hold down the Push Button. Apply the power and continue holding the push button until **2 flashes** are seen. At this point, release the button. You will see a long flash of two seconds and then the led will begin flashing again.

When **2 flashes** have been seen (or other value as found in the modules instructions) press and hold the button. You will see a long flash of five seconds and then 10 rapid flashes. The button can now be released and the programming is complete. The module will start running the program. If you make a mistake programming, simply repeat the process.

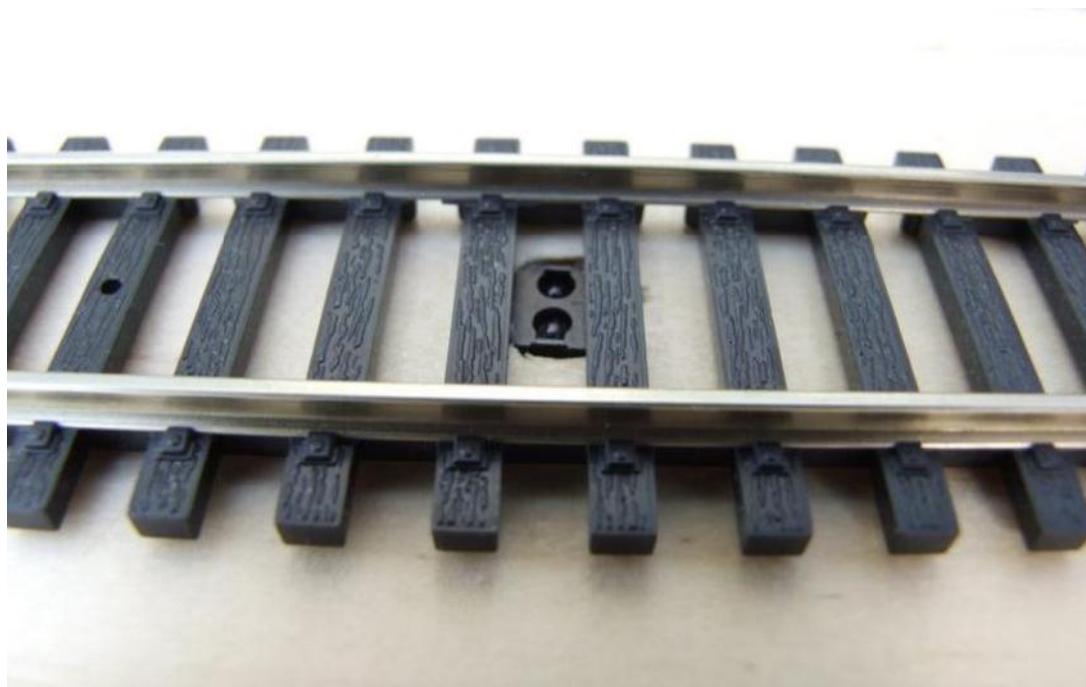
The module red led should now be seen to be flickering at a fast rate, signifying that the module is looking for reflection from an object passing the sensor.

Bringing your hand near the face of the sensor should result in the operation of the led changing (either going out, or changing to flash at a different rate). This confirms the sensor has detected your hand. If no change is seen, carefully check the connections to the C and E terminals against the photos above as either this, or choosing the wrong programme, is the most likely cause of the problem.

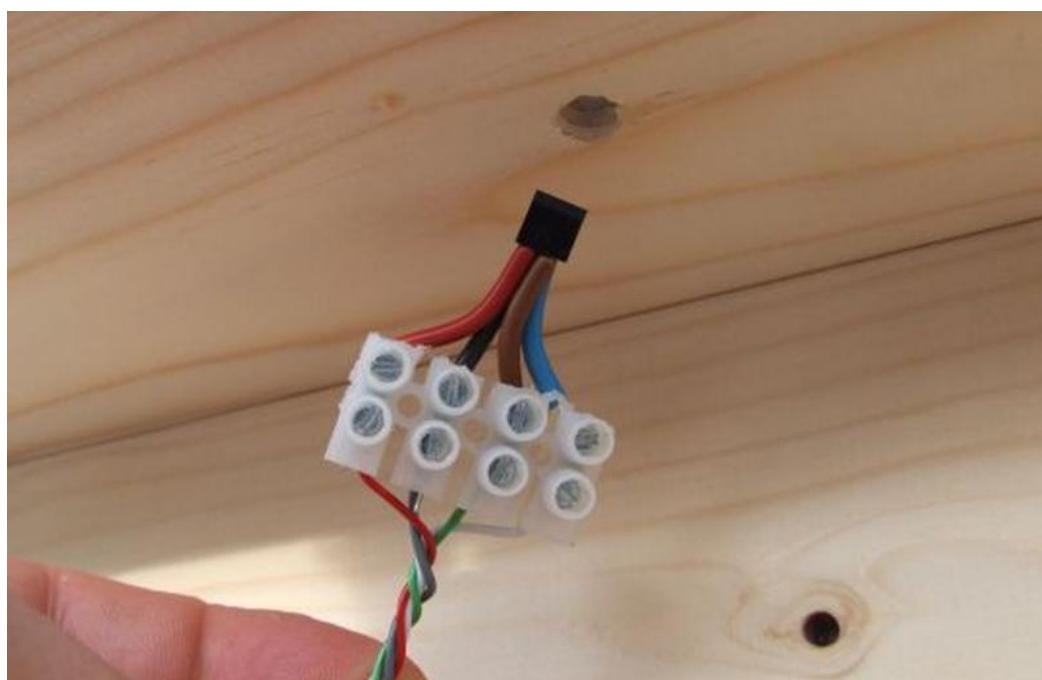
## Detecting Rolling Stock

Assuming the sensor has been successfully triggered by your hand, it should also be successfully triggered by rolling stock.

The sensor ideally needs to be located immediately below the sleepers, with an unobstructed view upwards.



The above image shows the sensor position between the sleepers on OO gauge track. If using N gauge track, the sensor needs to be positioned quite precisely, as the gap between the sleeper is only about 2.8mm and the sensor LEDs are 2.2mm diameter.



If the baseboard is particularly thick, difficulty may be experienced positioning the sensor close enough to the track bed. Trimming down some chocolate block and forming the leads should enable the sensor to be used with baseboard up to 18mm (3/4") thick.

For deeper baseboards, the sensor can be enclosed in a small tube of matt black paper and sit slightly further from the rail, whilst still functioning successfully.

Some experimentation may be required to avoid false triggering by varying the sensitivity adjustment (see module documentation).

Ideally, extend the sensor leads by soldering or using small crimps to ensure the sensor is in the optimum position immediately below the track-bed. Good connections will ensure the sensor functions reliably.